THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte J. DON BROCK

_____

Appeal No. 97-2642
Application No. 08/094,461[1]

_____

ON BRIEF

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Before FRANKFORT, McQUADE, and NASE, Administrative Patent Judges.

NASE, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1 through 8, 10 through 25 and 30 through

[1] Application for patent filed July 20, 1993.

37. Claim 9 has been allowed. Claims 26 through 29 have been canceled.

We AFFIRM-IN-PART.

BACKGROUND

The appellant's invention relates to a screed heating system and a method of employing exhaust heat for heating a screed. An understanding of the invention can be derived from a reading of exemplary claims 1 and 14, which appear in the appendix to the appellant's brief.

The prior art references of record relied upon by the examiner as evidence of obviousness under 35 U.S.C. § 103 are:

Jeppson	4,319,856	Mar. 16, 1982
McConnell	4,593,753	June 10, 1986
McEachern, Jr.	4,777,796	Oct. 18, 1988
Raymond	5,259,693	Nov. 9, 1993 (filed Mar. 6, 1992)

Claims 1, 2, 4 through 7, 10 through 16, 18, 19, 20, 22, 23, 24 and 30 through 34 stand rejected under 35 U.S.C. § 103 as being unpatentable over Raymond in view of Jeppson and McEachern.

Claims 3, 8, 16 through 19, 21, 25 and 35 through 37 stand rejected under 35 U.S.C. § 103 as being unpatentable over Raymond in view of Jeppson, McEachern and McConnell.

Rather than reiterate the conflicting viewpoints advanced by the examiner and the appellant regarding the § 103 rejections, we make reference to the examiner's answer (Paper No. 18, mailed November 15, 1996) for the examiner's complete reasoning in support of the rejections, and to the appellant's brief (Paper No. 17, filed September 12, 1996) and reply brief (Paper No. 19, filed January 17, 1997) for the appellant's arguments thereagainst.

OPINION

In reaching our decision in this appeal, we have given careful consideration to the appellant's specification and claims, to the applied prior art references, and to the respective positions articulated by the appellant and the examiner. As a consequence of our review, we make the determinations which follow.

As a preliminary matter, we have determined that both McEachern and McConnell are analogous art.[2] The test for non-analogous art is first whether the art is within the field of the inventor's endeavor and, if not, whether it is reasonably pertinent to the problem with which the inventor was involved. In re Wood, 599 F.2d 1032, 1036, 202 USPQ 171, 174 (CCPA 1979). A reference is reasonably pertinent if, even though it may be in a different field of endeavor, it logically would have commended itself to an inventor's attention in considering his problem because of the matter with which it deals. In re Clay, 966 F.2d 656, 659, 23 USPQ2d 1058, 1061 (Fed. Cir. 1992). In the present instance, we are informed by the appellant's originally filed specification (p. 2) that the invention is particularly directed to overcoming the drawbacks of the prior art, most notably the large pressure drops needed to provide the necessary heating to the oil. Both McEachern and McConnell teach heating a liquid without utilizing a large pressure drop and thus fall into the latter category of the

[2] The appellant argues (brief, pp. 22-25 and 43-44 and reply brief, p. 4) that McEachern and McConnell represent non-analogous art.

Wood test, and logically would have commended itself to an artisan's attention in considering the appellant's problem. Thus, we conclude that McEachern and McConnell are analogous art.

Claims 1, 2, 4-7, 10-16, 18, 19, 20, 22, 23, 24 and 30-34

Claims 1, 2, 4 through 7, 10 through 16, 18, 19, 20, 22, 23, 24 and 30 through 34 were rejected under 35 U.S.C. § 103 as being unpatentable over Raymond in view of Jeppson and McEachern.

Independent claims 1, 2, 5, 6, 18, 20 and 23 recite apparatus comprising, inter alia, an exhaust system of a paving machine, a screed of the paving machine, and a heat exchange system for transferring heat from the exhaust system to the screed via a heat exchange liquid. Independent claims 14, 15, 19 and 31 recite a method of heating a screed, inter alia, transferring heat from an exhaust system of a paving machine to a heat exchange liquid, and transferring heat from the heat exchange liquid to the screed of the paving machine.

Raymond discloses a method and apparatus for heating a screed. The general layout of an asphalt paving machine with a floating main screed equipped with adjustable screed extenders which is towed by a tractor is shown in Figure 4. As shown in Figures 2 and 3, the main screed unit of Raymond has a sole plate 16 and a pair of side-by-side frame sections 10, 11 each comprising an outer generally triangular side plate 12, an inner gusset plate 13, a deck plate 14, and a front moldboard 15. As shown in Figures 1 and 2, the screed unit is towed from a tractor by a pair of laterally spaced drag arms 29 of general L-shape which are pivotally connected to the tractor adjacent their forward ends and are pivotally connected to the screed unit by pins 30 extending through the side plates 12 and a pair of upstanding lever arms 31 which are welded at their lower ends to the deck plates 14. Jack screws 32 with universals 32a and operating handles 32b connect the upper ends of the lever arms 31 to the drag arms 29 so that the lever arms can be pulled forwardly or pushed rearwardly relative to the drag arms 29 to thereby adjust the plane of the sole plate 16 relative to the ground surface to vary the vertical attack angle of the screed. Raymond

provides adjustment for raising or lowering the center of the sole plate 16 relative to the lateral sides so that the sole plate can be dished upwardly to conform with a crown in the road, or can be dished downwardly to provide a valley to serve as drain area for a parking lot. As shown in Figures 3 and 5, the sole plate 16 of the main screed is provided with two sets of heat exchange tubes 46, one for each half, covered with insulating blankets 47. The tubes 46 are rectangular in cross-section so as to rest flat against the upper face of the sole plate. The heat exchange tubes on each half of the sole plate 16 form a respective serpentine path having straight parallel sections 46a extending lengthwise of the screed which are joined by curved end sections 46b. As shown in Figure 6, each sole plate extension screed 16a is provided with loops of tubing 46c, 46d interconnected by a flexible hose 46e which loops horizontally around the hinge assembly of the extension screeds. As shown in Figure 7, one of the loops 46c, 46d is connected by a flexible supply hose 48 to one end of the heat exchange tubing on the adjoining half of the main screed, and the other end is connected by a flexible return hose 49 to a reservoir 50. As shown in Figure 7, the tractor for an

asphalt paver normally has a hydraulic pump 52 for power take-off which is usually driven off the tractor engine and is supplied with oil from a reservoir 53 on the tractor. The output from the pump 52 is connected by a hose 54 to a selector unit 55 shown schematically in Figure 8 which alternately connects with a heat system port 58a or a vibrator system port 58b. The port 58a is connected to a shuttle valve 62 and a solenoid operated valve 64 arranged in parallel for controlling supply to a heat system supply line 66. The heat system supply line 66 connects to a hydraulic motor 76 which drives a high pressure hydraulic pump 78 taking suction from an oil reservoir 50. Output from the pump 78 flows through a primary flow restrictor 82 which functions to heat the oil responsive to a pressure drop across the restrictor. Most of the heated oil from the restrictor 82 returns directly to the reservoir 50 and the balance is divided into two like circuits at needle valves 84, 85 leading by flexible hoses 86, 87 to input ends of the heat exchange tubes on the two halves of the sole plate 16 of the main screed. The hot oil continues from the main screed to the heat exchange tubes on the screed extenders 16a by flexible hoses 48 and then returns to the oil

reservoir 50. Raymond teaches that only about three quarts of oil is required in the reservoir 50 and that the reservoir should also contain an air space which may, for example be equivalent in volume to about one-third of that occupied by the oil.

Jeppson discloses a paving machine. As shown in Figure 17, hot exhaust gas from an engine flows to gas manifold chamber 262 which includes a final slot 269 which directs the exhaust gas to a linear nozzle 271 which applies a stream of the hot exhaust gas along the upper surface of screed member 246. Maintaining the screed member 246 at a high temperature in this manner improves the action of the screed in that pavement constituents including asphalt do not tend to adhere to a metallic surface which is heated to a temperature sufficient to cause asphalt to act more or less in the manner of a lubricant.

McEachern discloses a heat recovery muffler system. McEachern teaches that internal combustion engines have many applications and that most commonly a muffler system is

connected to the exhaust port of the engine and that heat energy is lost to the atmosphere through escaping hot exhaust gases. McEachern also teaches that it is desirable to recover and utilize this heat energy that would otherwise be lost to the atmosphere. To overcome this disadvantage, McEachern discloses a heat recovery muffler system that efficiently recovers the heat contained in the hot exhaust gases. McEachern teaches that hot exhaust is led from the engine exhaust manifold directly to the exhaust inlet 14 by appropriate pipe means (not shown), and is introduced to the interior 28 of the vessel 12. The hot exhaust stream flows up through the interior 28 according to the sinuous path defined by the alternating baffle plates 20 and the spaces 24, 25 until it eventually escapes through exhaust outlet 16 to the atmosphere. Throughout the interior 28 and particularly at each space 24 and along each baffle plate 20, the hot exhaust stream encounters water or fluid 34 supplied via pump 40 and conduit means 43. The fluid 34 absorbs and stores the heat of the exhaust gases. Thus, the gases escape to the atmosphere at a reduced temperature having been stripped of their heat energy by transfer to the fluid 34. The heat energy stored in

the fluid 34 is transferred to a second fluid 56 by means of a conventional counter-current heat exchanger 11, 60 either within the vessel 12 (Figure 1) or external to the vessel 12 (Figure 2). The quantity of heat transferred depends in part on the surface area and conductivity of the coiled tube 50, 62 and on the temperature gradient between the fluid 34 and the second fluid 56. The surface area of the tube is maximized by coiling it and it is made of a material suitable for efficiently conducting heat from one side of the tube wall to the other. In both the internal and external embodiments, a pump 69 forces the second fluid 56 carrying the heat energy from the outlet 54, 68 to a location where it can be utilized (e.g., to passenger compartment heater 70).

In applying the test for obviousness,[3] we reach the conclusion that it would have been obvious to one of ordinary skill in the art at the time the invention was made to either

[3] The test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art. See In re Young, 927 F.2d 588, 591, 18 USPQ2d 1089, 1091 (Fed. Cir. 1991) and In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981).

(1) replace Raymond's oil heating system (i.e., the pressure drop across the restrictor 82) with a heating system utilizing exhaust gases, or (2) supplement Raymond's oil heating system (i.e., the pressure drop across the restrictor 82) with a preliminary heating system utilizing exhaust gases, as suggested and taught by the heat recovery muffler system of McEachern for the advantage of recovering and utilizing the exhaust heat energy that would otherwise be lost to the atmosphere especially in view of Jeppson's teaching of utilizing hot exhaust gas to heat a screed.

We have, of course, considered all of the appellant's arguments. However, we are not persuaded that the examiner erred in rejecting the appealed claims.

On pages 25-29 of the brief and pages 5-6 of the reply brief, the appellant specifically calls to our attention the issuance of U.S. Patent No. 5,308,190, for the purpose of showing the nonobviousness of the claimed invention. We recognize the issuance of U.S. Patent No. 5,308,190 with claims identical to appealed claims 20 through 25 and 30

through 32[4], however, the appellant has not cited any authority which holds that the issuance of a patent has any significant precedential value. In evaluating patentability under 35 U.S.C., each application must be evaluated on the record developed in the Patent and Trademark Office (PTO). See In re Gyurik, 596 F. 2d 1012, 1018 n.15, 201 USPQ 552, 558 n.15 (CCPA 1979) and In re Phillips, 315 F. 2d 943, 137 USPQ 369 (CCPA 1963). To the extent any error may have been made in the rejection or issuance of claims in a particular application, the PTO and its examiners are not bound to repeat that error in subsequent applications. Accord, In re Donaldson, 16 F.3d 1189, 1193, 29 USPQ2d 1845, 1849 (Fed. Cir. 1994) ("The fact that the PTO may have failed to adhere to a statutory mandate over an extended period of time does not justify its continuing to do so."); In re Cooper, 254 F.2d 611, 617, 117 USPQ 396, 401 (CCPA), cert. denied, 358 U.S. 840, 119 USPQ 501 (1958) (decision in a trademark application in accordance with law is not governed by possibly erroneous

[4] Appealed claims 20 through 25 and 30 through 32 were copied from U.S. Patent No. 5,308,190 for purposes of having an interference declared (37 CFR § 1.607).

past decisions of the Patent Office); In re Zahn, 617 F.2d 261, 267, 204 USPQ 988, 995 (CCPA 1980) ("[W]e are not saying the issuance of one patent is a precedent of much moment."); Ex parte Tayama, 24 USPQ2d 1614, 1618 (Bd. Pat. App. & Int. 1992) (prior issuance of patents for designs referred to as icons has no significant precedential value in evaluating compliance with 35 U.S.C. § 171). Furthermore, the issues of patentability under 35 U.S.C. § 103 raised in this application could not have been raised in determining patentability under 35 U.S.C. § 103 in U.S. Patent No. 5,308,190 since the Raymond patent applied to reject the claims under appeal in this application is not prior art to U.S. Patent No. 5,308,190.[5]

On pages 21-22 of the brief, the appellant argues that Raymond teaches away from the claimed invention. We do not agree. Raymond does not teach away from the use of exhaust gases to heat his oil. While Raymond does disclose that his

[5] Raymond is prior art to this application under 35 U.S.C. § 102(e) since the filing date of Raymond is prior the filing date of this application. However, since Raymond is not "by another," it is not prior art under 35 U.S.C. § 102(e) to U.S. Patent No. 5,308,190.

invention utilizes a pressure drop across the restrictor 82 to heat the oil, this teaching of a preferred embodiment does not constitute a teaching away. See In re Susi, 440 F.2d 442, 169 USPQ 423 (CCPA 1971) and In re Dunn, 349 F.2d 433, 146 USPQ 479 (CCPA 1965).

On pages 13-21 of the brief and pages 3-4 of the reply brief, the appellant argues that there is no suggestion in any of the cited references that an exhaust heater could be used to heat a screed passively and indirectly. We do not agree. Initially we note that while there must be some teaching, reason, suggestion, or motivation to combine existing elements to produce the claimed device, it is not necessary that the cited references or prior art specifically suggest making the combination (see B.F. Goodrich Co. v. Aircraft Braking Systems Corp., 72 F.3d 1577, 1583, 37 USPQ2d 1314, 1319 (Fed. Cir. 1996) and In re Nilssen, 851 F.2d 1401, 1403, 7 USPQ2d 1500, 1502 (Fed. Cir. 1988)) as the appellants would apparently have us believe. Rather, as stated previously in footnote 3, the test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in

the art. Moreover, all that a reference discloses must be evaluated for what it would have fairly taught one of ordinary skill in the art (see In re Boe, 355 F.2d 961, 964, 148 USPQ 507, 510 (CCPA 1966)) and in evaluating such references it is proper to take into account not only the specific teachings of the references but also the inferences which one skilled in the art would reasonably be expected to draw therefrom (see In re Preda, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968)). After considering the collective teachings of the applied prior art, we agree with the examiner that it would have been obvious to one of ordinary skill in the art at the time of the appellant's invention to augment or replace Raymond's oil heating system (i.e., the pressure drop across the restrictor 82) with a heating system utilizing exhaust gases as suggested and taught by McEachern for the advantage of recovering and utilizing the exhaust heat energy of Raymond's internal combustion engine that would otherwise be lost to the atmosphere especially in view of Jeppson's teaching of utilizing hot exhaust gas to heat a screed.

On pages 30-31, 34 and 40-41 of the brief and pages 6 and 8 of the reply brief, the appellant argues that the system of Raymond is not a "closed loop." Claims 4, 13 and 32 recite that the liquid circulates in a "closed loop." In our view, the broadest reasonable interpretation[6] of the term "closed loop" as used herein is that a flow path recirculates the liquid and the flow path is not constantly exposed to the atmosphere. The flow path of oil in Raymond is a closed loop. Contrary to the appellant's argument, the mere fact that Raymond's loop includes the reservoir 50 does not by definition make the loop open. Raymond's reservoir 50 must be closed (i.e., not constantly exposed to the atmosphere) since he teaches that the reservoir 50 contains an air space. The flow path of the second fluid 56 in McEachern is a closed loop. It is our opinion that the modified flow path suggested

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[6] In proceedings before the PTO, claims in an application are to be given their broadest reasonable interpretation consistent with the specification, and that claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art. In re Sneed, 710 F.2d 1544, 1548, 218 USPQ 385, 388 (Fed. Cir. 1983). Moreover, limitations are not to be read into the claims from the specification. In re Van Geuns, 988 F.2d 1181, 1184, 26 USPQ2d 1057, 1059 (Fed. Cir. 1993) citing In re Zletz, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989).

by the prior art as combined above would have been in a closed loop.

On page 31 of the brief and page 6-7 of the reply brief, the appellant argues that the claim 5 limitation of heating the oil to a temperature between 250°F and 300°F is not suggested by the applied prior art. We do not agree. Raymond clearly teaches (column 1, lines 45-48) that an oil temperature of about 275°F is needed to establish the desired screed temperature of about 200°F. It is our opinion that the combined teachings of the applied prior art as combined above would have heated the oil to a temperature of about 275°F especially since the heat exchange units on the screed would not have been altered by the combined teachings of the applied prior art.

On page 32 of the brief and page 7 of the reply brief, the appellant argues that the return line recited in claim 10 is not suggested by the applied prior art. We do not agree. As set forth above, it is our opinion that the combined teachings of the applied prior art would have suggested

replacing Raymond's oil heating system (i.e., the pressure drop across the restrictor 82) with a heating system utilizing exhaust gases. The resulting structure would have the oil returned in a return line from the second heat exchanger (i.e., Raymond's heat exchanger tubes 46) to the first heat exchanger (i.e., McEachern's heat exchanger 11) and the oil fed in a feed line from the first heat exchanger (i.e., McEachern's heat exchanger 11) to the second heat exchanger (i.e., Raymond's heat exchanger tubes 46).

On page 33 of the brief, the appellant argues that the flexible portions of the feed and return lines recited in claim 11 is not suggested by the applied prior art. We do not agree. Raymond teaches that flexible hoses 86, 87 transmit the oil to the heat exchange tubes 46 and that flexible hose 49 returns the oil. It is our opinion that the combined teachings of the applied prior art as combined above would have suggested portions of the feed and return lines leading from the paving machine to the floating screed be flexible as suggested and taught by Raymond's hoses 49, 86 and 87.

On pages 34-35 and 37 of the brief and page 8 of the reply brief, the appellant argues that the low-pressure pump recited in claims 13 and 20[7] is not suggested by the applied prior art since the pump 78 of Raymond is a high-pressure pump. We do not agree. In our view, the claimed a low-pressure pump reads on the pump 69 of McEachern since (1) the appellant's disclosure does not specify the pressure at which their low-pressure pump 32 operates, (2) the pump 69 of McEachern would appear to operate at a pressure much lower than Raymond's pump 78, and (3) the pump 69 of McEachern would need to operate only at a pressure sufficient to assure circulation of the fluid through the system. Thus, it is our opinion that the combined teachings of the applied prior art as combined above would have included a low-pressure pump as suggested and taught by McEachern.

For the reasons set forth above, we sustain the examiner's rejection of claims 1, 2, 4 through 7, 10, 11, 13

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[7] Claim 20 recites circulating means which as disclosed in the specification is a low-pressure pump.

through 16, 18, 19, 20, 22, 23, 24 and 30 through 32 under 35 U.S.C. § 103.

On pages 33-34 and 42 of the brief, the appellant argues that the plurality of flexible hoses bridging a flexible portion of the screed recited in claims 12 and 34 is not suggested by the applied prior art. We agree. The examiner's conclusion of obviousness (answer, pp. 7, 16 and 19) has no factual support. On page 41 of the brief, the appellant argues that the single serpentine heat exchanger having a plurality of rigid channels mounted on opposed sides of the screed recited in claim 33 is not suggested by the applied prior art. We agree. The examiner's conclusion of obviousness (answer, p. 19) has no factual support.

The conclusion that the claimed subject matter is obvious must be supported by evidence, as shown by some objective teaching in the prior art or by knowledge generally available to one of ordinary skill in the art that would have led that individual to combine the relevant teachings of the references to arrive at the claimed invention. See In re Fine, 837 F.2d

1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Since the subject matter of claims 12, 33 and 34 would not have been obvious under 35 U.S.C. § 103 based on the applied prior art, we reverse the examiner's rejection of claims 12, 33 and 34.

Claims 3, 8, 16-19, 21, 25 and 35-37

Claims 3, 8, 16 through 19, 21, 25 and 35 through 37 were rejected under 35 U.S.C. § 103 as being unpatentable over Raymond in view of Jeppson and McEachern as applied to claims 1, 2, 4 through 7, 10 through 16, 18, 19, 20, 22, 23, 24 and 30 through 34 above, and further in view of McConnell.

McConnell discloses a heat exchanger system for utilizing the exhaust gases of an internal combustion engine to heat liquid. McConnell teaches that his system is not limited in its application to hot water type cleaning systems since the energy obtained by way of heated liquid may be utilized in many other applications (column 1, lines 12-15 and column 4, lines 35-39). As shown in Figure 1, an internal combustion engine exhaust manifold 10 has exhaust pipes 11 and 12 extending therefrom and connecting to a main heat exchanger

13. The engine 29 has two exhaust ports which correspond with the respective exhaust pipes 11 and 12 such that exhaust gases discharged from the engine pass immediately into the pipes 11 and 12 and thereafter to the main heat exchanger 13. The heat exchanger 13 consists essentially of a pair of concentric copper tubes 14 and 15, respectively, which extend between opposed end plates 16 and 17. An annular water jacket is provided in the gap between the inner tube 15 and the outer tube 14. The exhaust pipes 11 and 12 are connected to the heat exchanger 13 in a manner whereby exhaust gases from the engine pass into the bore of the inner tube 15. A secondary exhaust pipe 21 is connected to the heat exchanger 13 and provides an outlet for exhaust gases entering the bore of inner tube 15 via the exhaust pipes 11 and 12. The secondary exhaust pipe 21 carries the exhaust gases to an exhaust system appropriate to the particular engine where such exhaust gases are dissipated. A hot water circuit consisting essentially of a copper tube 23 provides a serial circuit via auxiliary heat exchangers in the form of coils formed in the copper tube 23 around the exhaust pipes 11 and 12 and the secondary exhaust pipe 21. The serial circuit includes a pump 24 and a holding

tank 25. The holding tank 25 stores hot water produced by the system which is returned to the tank 25 from the heat exchanger 13 via a hose
connected to a copper tube 26 which is an extension of the copper tube 23 on the primary or input side of the heat exchanger 13. The pump 24 draws water from the bottom of the holding tank 25 and pumps the water through the copper tube 23 in its path around the various exhaust pipes. After passing around the exhaust pipes in contact therewith the copper tube 23 is connected via a hose to an inlet 27 in the outer tube 14 of the heat exchanger 13, adjacent one end thereof. Water in the copper tube 23 therefore enters the water jacket 20 and is able to pass along
the length of the heat exchanger 13 to an outlet 28 at the opposite end of the heat exchanger 13. Once passing out of the heat exchanger 13 the water returns to the holding tank 25 from which it may be drawn on to the remainder of the system (not shown) or recirculated by the pump 24 to be further heated.

We agree with the appellant (brief, pp. 44-47, 49 and 50) that the details of the booster heater recited in dependent claims 3, 17, 36 and 37 and independent claim 8 are not taught or suggested by the applied prior art. Specifically, the applied prior art does not suggest or teach a fuel-fired booster heater (claims 3 and 8), a third heat exchanger which receives heat from a burner (claim 17), or a fuel-fired burner (claims 36 and 37). Since the subject matter of claims 3, 8, 17, 36 and 37 would not have been obvious under 35 U.S.C. § 103 based on the applied prior art, we reverse the examiner's rejection of claims 3, 8, 17, 36 and 37.

With regard to claims 16, 18 and 19, we have affirmed the rejection of these claims above based on the combined teachings of Raymond, Jeppson and McEachern. The additional teachings of McConnell are merely surplusage and does not alter our view that the combined teachings of the applied prior art would have suggested the claim subject matter of claims 16, 18 and 19. In that regard, it is our view that when Raymond's oil heating system (i.e., the pressure drop across the restrictor 82) has been augmented with a heating

system utilizing exhaust gases as suggested and taught by McEachern interposed upstream of Raymond's restrictor 82, the claimed additional heating of claim 16 and the booster heater of claims 18 and 19 read on the heating that would take place by the pressure drop across Raymond's restrictor 82. Accordingly, the examiner's rejection of claims 16, 18 and 19 under 35 U.S.C. § 103 based on the combined teachings of Raymond, Jeppson, McEachern and McConnell is affirmed.

With regard to claims 21, 25 and 35, we agree with the examiner (answer, p. 9) that it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Raymond's system by transferring heat to the oil from the engine's exhaust by coiling the oil pipe around an exhaust pipe as suggested and taught by McConnell.

We do not agree with the appellant's argument that McConnell is non-analogous art for the reasons set forth above. The only other argument (brief, p. 49, reply brief, pp. 12-13) raised is that the single serpentine heat exchanger recited in claim 35 is not suggested by the applied prior art.

We do not agree. The single serpentine heat exchanger recited in claim 35 does not define over the two serpentine heat exchangers on the opposed sides of the screed taught by Raymond.[8] Thus, the claimed single serpentine heat exchanger reads on one of the two serpentine heat exchangers taught by Raymond.

For the above reasons, the examiner's rejection of claims 21, 25 and 35 under 35 U.S.C. § 103 based on the combined teachings of Raymond, Jeppson, McEachern and McConnell is affirmed.

CONCLUSION

To summarize, the decision of the examiner to reject claims 1 through 8, 10 through 25 and 30 through 37 under 35 U.S.C.

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[8] We note that we have reversed the examiner's rejection of claim 33 above which recites that the single serpentine heat exchanger has a plurality of rigid channels mounted on opposed sides of the screed. Claim 35 does not recite this same limitation.

§ 103 is affirmed with respect to claims 1, 2, 4 through 7, 10, 11, 13 through 16, 18 through 25, 30 through 32 and 35, but is reversed with respect to claims 3, 8, 12, 17, 33, 34, 36 and 37.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

CHARLES E. FRANKFORT Administrative Patent Judge	)
JOHN P. McQUADE Administrative Patent Judge	) BOARD OF PATENT APPEALS AND INTERFERENCES
JEFFREY V. NASE Administrative Patent Judge	)

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APPEAL NO. 97-2642 - JUDGE

APPLICATION NO. 08/094,461

APJ NASE

APJ McQUADE

APJ FRANKFORT

DECISION: **AFFIRMED-IN-PART**

Prepared By: Delores A. Lowe

DRAFT TYPED: 01 May 98

FINAL TYPED: